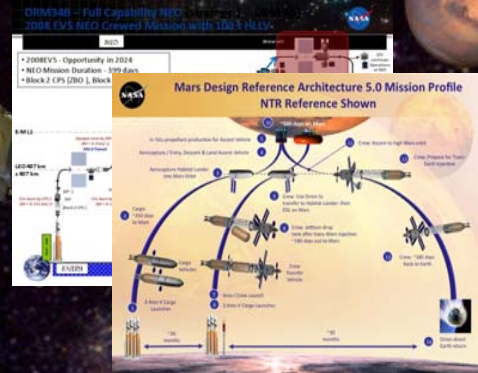


# Practicing for Mars: The International Space Station (ISS) as a Testbed

David H. Korth, Flight Director  
NASA Johnson Space Center  
[david.h.korth@nasa.gov](mailto:david.h.korth@nasa.gov)

*Humans to Mars Conference  
Washington, D.C.  
24 April, 2014*





**Allows demonstration and development of exploration capabilities to help accomplish future missions sooner with less risk to crew and mission**

[illegible]

- **High fidelity human operations platform in LEO:**
  - **Continuously operating habitat and active laboratory**
  - **High fidelity systems**
  - **Astronauts as test subjects**
  - **Highly experienced ground operations teams**
- **Offers a controlled test environment:**
  - **Consequences to systems performance and decision making not offered in ground analogs**
- **International participation**
- **Continuously improving system looking for new technology and ideas to improve operations**



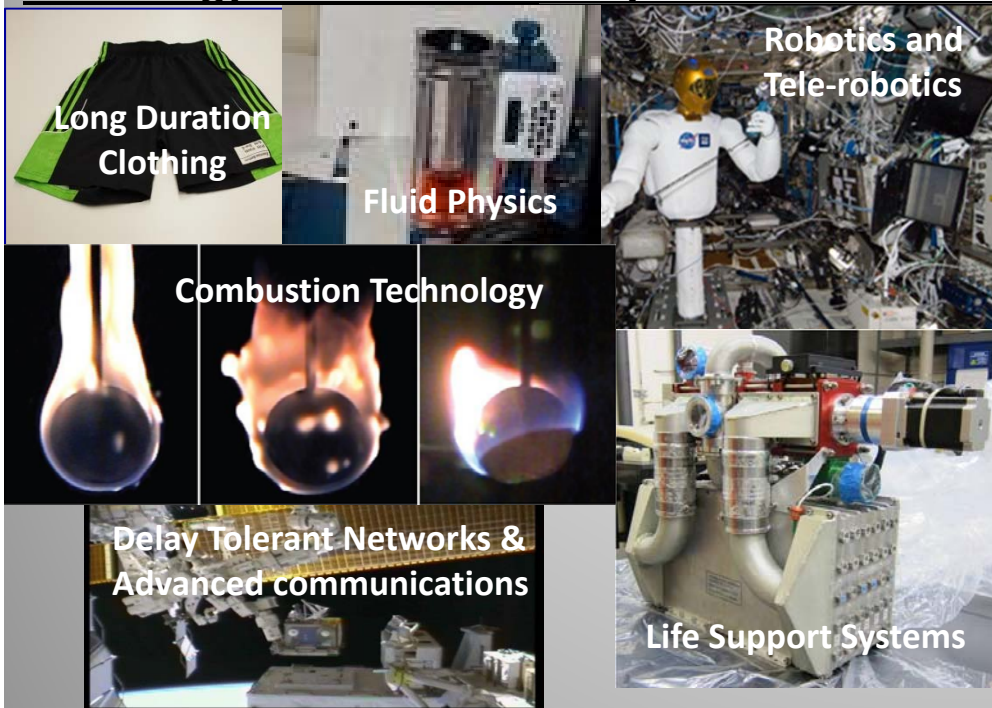
## Earth-based Analog



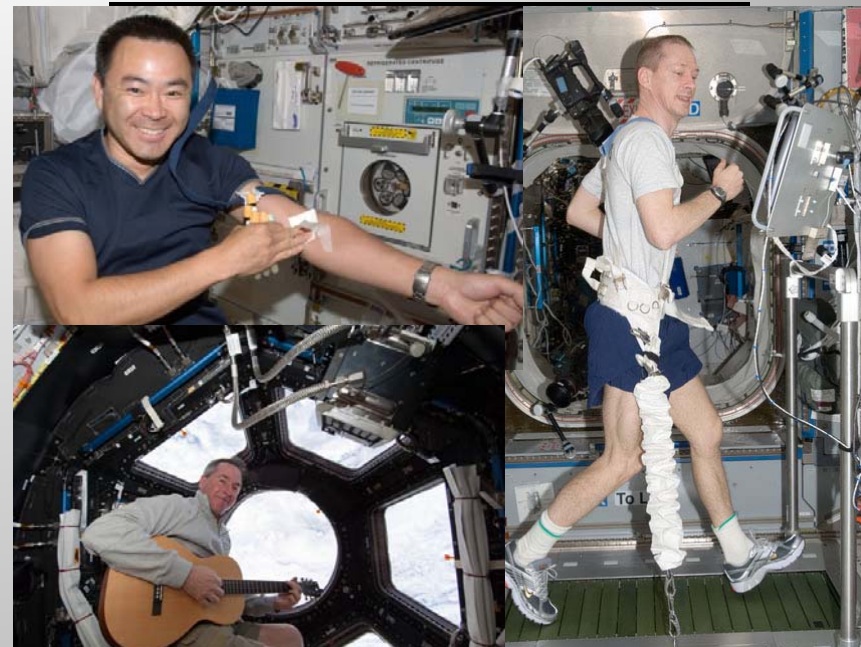


# What are we doing on ISS?

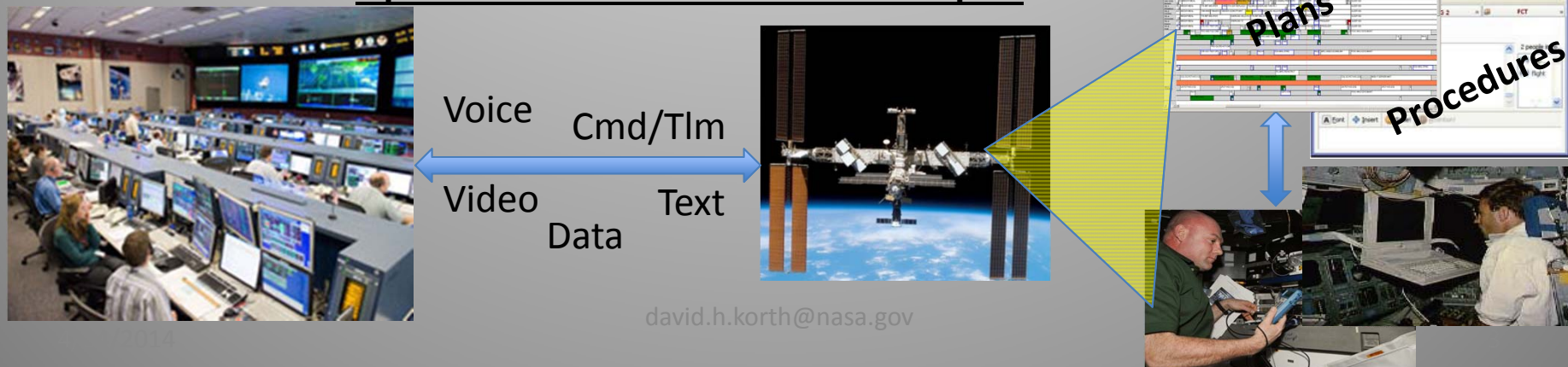
## Technology Demos & Critical Systems Maturation



## Human Health and Performance



## Operations Simulations and Techniques





# Exploration testing plans

- Exploration prep testing on ISS has been ongoing since 2012
  - Number of tests increasing with each ISS expedition
- One Year Crew Expedition starting in Spring 2015
  - ROSCOSMOS and NASA are partnering on the Participating Crew are Mikhail Kornienko and Scott Kelly
  - Majority of testing is an extension of current Human Biomedical Research investigations
  - Plan for extending & expanding upon current operations techniques and tech demo studies
- ESA 10 Day Mission in Fall 2015
  - ESA astronaut focus on testing exploration technologies
- Many more opportunities throughout the life of ISS!



## NASA HRP Pre-flight Milestones for One-Year Mission

Corresponding FSA, JAXA, ESA, CSA milestones to be provided through MHRPE

US and Russian Candidate Investigations for One-Year Mission				
2012	30 Nov	L-28	NASA and ROSCOSMOS exchange lists of candidate investigations	
February	L			
March	L			
June	L			
2013	August	L		
September	L			
November	L			
December	L			
January	L			
February	L			
March	L			
early April	L			
April	L			
May	L			
June	L			
2014	30 Mar	L		
18 July 2013				

## International Partner Candidate Investigations for One-Year Mission

Partner	PI	Title	Possible Match	
			NASA	Roscosmos
JAXA	Mukai	Biological Rhythms – 48 hours	ActiWatch	Pilot-T
	Mukai	ICP – 1 year	Ocular Health	(Medical mandatory)
	Mukai	Myco	Microbiome	(Under review)
ESA	Blanc	Energy	Fluid Shifts (under review)	Chibis
	Chouker	Immuno-2 (co-investigator)	Biochemical Profile, Surveillance	Immuno-2